

### **REMARKS**

Claims 1-14 and 29-34 are all the claims pending in the application. Claims 8-14 are allowed. Claims 32 and 33 stand rejected on informalities. Claims 1-7 and 29-34 stand rejected on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion.

#### **I. The 35 U.S.C. 112, Second Paragraph Rejection**

Claims 32 and 33 are rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 33 have been amended as suggested in the Office Action to overcome this rejection. Claim 32 was previously amended to remove the word "panel." Therefore, Applicants respectfully submit that no antecedent basis issues exist with respect to claim 32 as previously amended. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

#### **II. The Prior Art Rejections**

Claims 1, 3, 4, 5, and 29-31 stand rejected under 35 U.S.C. §102(b) as being anticipated by Hite et al. (U.S. Patent 4,863,878) hereinafter "Hite." Claims 2, 6, 7, and 32-34 stand rejected under 35 U.S.C. §103 (a) as being unpatentable over Hite. Applicants respectfully traverse these rejections based on the following discussion.

##### **A. The 35 USC §102(b) Rejection Based on Hite**

One feature of the present invention is that the epitaxial layer is directly on the top surface of the silicon substrate and is grown from the silicon substrate. The oxygen content of the top surface of the silicon substrate is below an amount that would prevent epitaxial growth from

silicon substrate, thereby allowing the epitaxial layer to be grown from the silicon substrate. Conventional structures are required to use a sacrificial layer to allow the epitaxial growth and trace amounts of this sacrificial layer may remain between the epitaxial layer and the silicon substrate. To the contrary, with the claimed invention the epitaxial layer is directly on the silicon substrate since it is grown from the silicon substrate. By restricting the increase in the oxygen content to a level below that which would form a separate distinct layer as discussed above, the claimed invention can epitaxially grow the silicon layer 200 on the top surface 102 of the silicon substrate 100, as shown in Applicants' FIG. 2.

Hite does not disclose that the epitaxially grown layer 7, 27 is formed from the silicon dioxide layer 3, 23, but instead teaches that a non-oxygenated crystalline silicon layer 5, 25 is consumed to form the epitaxial layer 7, 27. The silicon dioxide layer 3, 23 has an oxygen content that is too high to allow epitaxial growth from the silicon layer 5, 25. Therefore, Hite does not teach "an epitaxial silicon layer directly on said top surface of said silicon substrate and grown from said silicon substrate" where "said oxygen content of said top surface of said silicon substrate is below an amount that would prevent epitaxial growth from said silicon substrate" as defined by independent claim 1 and independent claim 29.

In Hite, a non-oxygenated crystalline silicon layer 5, 25 is consumed to form the epitaxial layer 7, 27. The silicon dioxide layer 3, 23 has an oxygen content that is too high to permit epitaxial growth which is why Hite adds the non-oxygenated crystalline silicon layer 5, 25 before growing the epitaxial layer 7, 27 (column 1, lines 40-53). Applicants note that layers 23 and 25 are not specifically described in Hite; however, Hite explains that the only difference between the structures shown in Figures 1A-1D and Figures 2A-2D relates to the omission of an annealing step (column 3, lines 2-10) thereby indicating that layers 3 and 23 are the same, and that layers 3 and 25 are the same.

The oxygen content within the silicon dioxide layer 3, 23 is too high to allow an epitaxial layer to be grown thereon. Therefore, the silicon dioxide layer 3, 23 does not meet the claim limitation which provides that the "oxygen content of said top surface of said silicon substrate is below an amount that would prevent epitaxial growth from said silicon substrate" as defined by independent claims 1 and 29 because the oxygen content within the silicon dioxide layer 3, 23 is

too high to allow epitaxial growth. Further, the increased oxygen level within the substrate 1, 21 in Hite similarly does not meet this claim limitation because the epitaxial layer 7, 27 is not formed on the substrate layer 1, 21, but instead is formed on the silicon dioxide layer 3, 23 in Hite.

To the contrary, the claimed "oxygen content of said top surface of said silicon substrate" is below an amount that would prevent epitaxial growth from the silicon substrate. As shown in Figures 2, 6, and 7, and as described in paragraphs 25, 28, 30, and 31, the epitaxial layers 200, 602, 702 are grown on (from) the underlying substrate, without the use of any additional sacrificial layers such as the non-oxygenated crystalline silicon layer 5, 25 that is consumed to form the epitaxial layer 7, 27 in Hite. While the specification does not directly use the terminology "from said silicon substrate," or "directly on said top surface of said silicon substrate" one ordinarily skilled in the art would understand that the various epitaxial layers 200, 602, 702 are grown from the underlying substrate 100, 400 because no intervening layers or sacrificial materials are described in the specification or illustrated in the drawings. Instead, as shown in the flowcharts in Figures 8 and 9, in steps 812 and 912 the epitaxial growth process is performed after the oxygen content of the substrate is increased (steps 802 and 910) without any intervening layer or sacrificial substance being utilized. Therefore, one ordinarily skilled in the art would understand that the upper portion of the substrate that has the increased oxygen content is being consumed in the epitaxial growth process and not some other layer or sacrificial material and that the growth occurs from the substrate. Thus, Applicants respectfully submit that the newly added claim language is fully supported by the specification as originally filed and that no new matter is being added.

Therefore, it is Applicants' position that Hite does not teach the claimed structure that includes "an epitaxial silicon layer directly on said top surface of said silicon substrate and grown from said silicon substrate" where "said oxygen content of said top surface of said silicon substrate is below an amount that would prevent epitaxial growth from said silicon substrate" as defined by independent claim 1 and independent claim 29. Thus, Applicants submit that independent claims 1 and 29 are not anticipated by Hite. Further, dependent claims 3, 4, 5, and 30-34 are similarly not anticipated by Hite, not only because they depend from a non-anticipated

claim, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

**B. The 35 USC §103 Rejection Based on Hite**

Applicants respectfully traverse this rejection because Hite discloses an epitaxially grown layer 7, 27 formed on a silicon dioxide layer 3, 23. The silicon dioxide layer 3, 23 has an oxygen content that is too high to allow epitaxial growth. Therefore, Hite does not teach or suggest "an epitaxial silicon layer directly on said top surface of said silicon substrate and grown from said silicon substrate" where "said oxygen content of said top surface of said silicon substrate is below an amount that would prevent epitaxial growth from said silicon substrate" as defined by independent claim 1 and independent claim 29.

In Hite, a non-oxygenated crystalline silicon layer 5, 25 is consumed to form the epitaxial layer 7, 27. The silicon dioxide layer 3, 23 has an oxygen content that is too high to permit epitaxial growth which is why Hite adds the non-oxygenated crystalline silicon layer 5, 25 before growing the epitaxial layer 7, 27 (column 1, lines 40-53). Applicants note that layers 23 and 25 are not specifically described in Hite; however, Hite explains that the only difference between the structures shown in Figures 1A-1D and Figures 2A-2D relates to the omission of an annealing step (column 3, lines 2-10) thereby indicating that layers 5 and 23 are the same, and that layers 5 and 25 are the same.

The oxygen content within the silicon dioxide layer 3, 23 is too high to allow an epitaxial layer to be grown thereon. Therefore, the silicon dioxide layer 3, 23 does not meet the claim limitation which provides that the "oxygen content of said top surface of said silicon substrate is below an amount that would prevent epitaxial growth from said silicon substrate" as defined by independent claims 1 and 29 because the oxygen content within the silicon dioxide layer 3, 23 is too high to allow epitaxial growth. Further, the increased oxygen level within the substrate 1, 21 in Hite similarly does not meet this claim limitation because the epitaxial layer 7, 27 is not formed on the substrate layer 1, 21, but instead is formed on the silicon dioxide layer 3, 23 in Hite.

Therefore, it is Applicants' position that Hite does not teach or suggest the claimed structure that includes "an epitaxial silicon layer directly on said top surface of said silicon substrate and grown from said silicon substrate" where "said oxygen content of said top surface of said silicon substrate is below an amount that would prevent epitaxial growth from said silicon substrate" as defined by independent claim 1 and independent claim 29. Thus, Applicants submit that independent claims 1 and 29 are patentable over Hite. Further, dependent claims 2, 6, 7, and 30-34 are similarly patentable over Hite, not only because they depend from a patentable claim, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

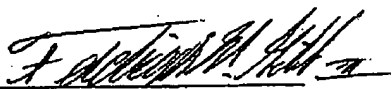
## II. Formal Matters and Conclusion

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0458.

Respectfully submitted,

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